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Enclosed*

represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void space that constitutes from about 10 to about 40 volume percent the total volume of said padding material.

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#### REMARKS RE: ADMINISTRATIVE MATTERS

1. Enclosed, please find applicants' request for an extension of time to respond under Rule 1.17(a) and a check in the amount of \$920. If any other fees are required, please charge our firm's Deposit Account No. 04-1414.

#### REMARKS RE: CLAIM AMENDMENTS

2, 3. Claims 26-28 have been amended in the manner suggested by the Examiner. All of the other amended claims have been amended to call for the use of plastic bead materials as opposed to ceramic microsphere materials such as those taught in U.S. Patent 5,888,642. Applicants believe this narrowing of the claims to plastic beads when taken in combination with the limitations previously presented in the claims patentably defines over the art of record as discussed in more detail below.

#### REMARKS CONCERNING PRIOR ART

##### 4, 5. Re: U.S. Patent 5,888,642 ("the '642 patent")

Applicants begin their remarks concerning the teachings of the prior art by responding to the Examiner's comments regarding the import and/or the weight that should be given to the preamble of applicant's claims vis-à-vis the body of the claims, especially in view of the Kropa v. Robie decision. To this end, applicants would first respectfully take issue with several of the interpretations and/or assertions made in paragraph 5 on page 3 of the Office Action. To begin, applicants are of the opinion that the proper subject of the preamble of all of the independent claims is not simply a "padding material", but rather a "breathable, bead/adhesive/void space padding material". The Examiner is then asked to consider that the teachings and spirit of applicants' disclosure are focused upon the "breathability" of the subject materials. Indeed, the second word of all of the independent claims is "breathable". As we will see in subsequent portions of this response, none of the cited references - the '642 patent included – is concerned with the subject of the "breathability" of their resulting

materials. Indeed, as we will see in subsequent portions of this response, some of the cited references – the '642 patent included - teach away from the concept of breathability.

Returning to the Kropa v. Robie decision, we note that it contains the following passage:

**"2. Construction of specification and claims - Introductory phrase**

Preambles to claims in cited cases were held not to be limitations where claims were drawn to a structure and portion of claim following preamble was a self-contained description of structure not depending for completeness upon introductory clause, or where claim was drawn to a product and introductory clause merely recited a property inherent in old composition defined by remaining part of claim; in those cases, claim apart from introductory clause completely defined subject matter, and preamble merely stated a purpose or intended use of subject matter; in other cited cases, where preamble was expressly or by necessary implication given effect of a limitation, introductory phrase was deemed essential to point out invention; in such cases, preamble was considered necessary to give life, meaning, and vitality to claims; usually, there inhered in article specified in preamble a problem transcending that before prior artisans and solution of which was not conceived by or known to them; nature of problem characterized elements comprising article, and recited in body of claim following introductory clause, so as to distinguish claim over prior art." (emphasis added)

Applicants assert that their claims fall under the above underlined language concerning those cases where the preamble is "expressly or by necessary implication given effect of a limitation" that gives "life, meaning, and vitality to claims". In other words, given the above-underlined portions of Kropa v. Robie, it seems to applicants that those portions of the claims following their respective preambles are not self-contained descriptions. On the contrary, those portions of applicants' claims appearing after their respective preambles depend very heavily on a word in the preamble – namely, the word "breathable". Applicants also are of the opinion that the presence of the word "breathable" in their preambles is a quality produced by the particular descriptions appearing after the preamble, i.e., the words appearing after the preamble are not totally "self-contained descriptions". In short, the concept of breathability is needed to complete applicants' description of their material. Applicants would also assert in passing that their claims are more in the nature of composition claims rather than "structure" claims.

Next, applicants would submit that the '642 patent to Meteer does not teach a "catalyst solution"(emphasis added). Column 5, Lines 50 to 59 of column 5 of the '642 patent reads as follows:

"A coating of an adhesion promoting material can be provided on the microspheres, such as a silane coating, to facilitate wet out of the microspheres which results in better adhesion. Alternately an adhesion enhancing material and the resin powder or a catalyst might be included in a thermosetting powdered resin. For example, when the resin is a phenolic resin a catalyst such as hexamethylenetetramine can be included which can be cured in an oven at a temperature in the order of 350 degrees F." (emphasis added).

The Examiner is asked to consider that the expression "wet out" in the above paragraph may well refer to a system, or process, wherein a silane coating is sprayed (e.g. as a silane solid particle aerosol) onto the microspheres as a light coating. Indeed, even if one assumes that the silane coating material was in fact a liquid when coated onto the microspheres, such a liquid may well have dried before the microspheres and the adhesive are placed in contact with each other. The '642 patent does not speak to this point. Moreover, even if one assumes the silane was, in fact, a liquid when it was first placed on the microspheres, that does not make the adhesive a liquid when it first comes into contact with presumably wet microspheres a la the teachings of applicants' disclosure. Applicants are also of the opinion that the second underlined portion of the above passage teaches that if a liquid adhesion enhancing material or catalyst were used, it still may well become a component of a "powdered" resin (i.e., a dry resin).

The '642 patent also contains other passages that teach away from applicants' concept of the adhesive component being in a liquid state when it is first contacted with its microspheres. These and other differences between applicants' methods of making their materials and those taught by the '642 patent are best illustrated by quoting and then commenting upon certain underlined portions of another passage of '642 patent that runs from its column 1, line 50 to column 2, line 8:

"A number of product properties can be imparted to a product by use of a reactive resin in powdered form that cannot be accomplished with resin in a liquid form. For example, the bulk density of powdered resin is much less than the bulk density of solid resin of the same composition or liquid formed of the resin by heating it to a melted condition. An important advantage of using powdered resin mixed with ceramic microspheres to form a syntactic foam layer according to the present invention is that the bulk density of the final product

can be the same as that of the initial compacted mixture. During heating of the mixture, the powdered resin is converted to belted droplets which can flow over and join the microspheres of the mixture and may be aided by an adhesion promoting coating, for example a coupling agent, on the microspheres. The mixture is thus in a sense coalesced into a mass, which upon hardening provides a light weight solid foam layer. The foam layer includes closed voids containing evolved gas and air. The bulk density of syntactic foam material as in the present invention can be half that of a conventional material made from liquid resin with intermixed microspheres. Additionally, the present invention eliminates the problems of high viscosity when many microspheres are added to a liquid resin, and eliminates the process problem of getting microspheres (which tend to float) wetted out and incorporated into a liquid resin."

Thus, the above passage from the '642 patent suggests that certain desired features (e.g., reduced bulk density) cannot be obtained when the resin is initially employed in a liquid form. In response to such problems, the '642 patent goes on to teach and claim use of powdered resin components as the adhesive. This admonition is, however, precisely what the applicants do – i.e., they use a liquid form of adhesive. The above passage then goes on to tout the use of solid resins (such as the '642 patent employs) to create systems that have "closed voids" that contain evolved gas and air. And this is precisely what applicants do not do – i.e., they do not get and do not want "closed voids". On the contrary, applicants want open voids because this quality helps give their padding materials their desired quality of breathability. In other words, the '642 patent's disclosure of "closed voids" that contain evolved gas teaches away from applicants' concept of "breathability". Thus, it would appear that, at best, the '642 patent teaches a system wherein the microspheres are "wetted". This circumstance, if true in the sense noted above, does not, however, teach or reasonably suggest that the '642 patent's microspheres are so wetted that the adhesive ingredient goes into a liquid state.

The '642 patent also teaches and claims use of several other different features not found in applicants' claims (especially as now amended). Some of these other different features are underlined in the following rendition of claim 1 of the '642 patent.

"1. A syntactic foam core material for layered composite structures comprising in combination  
a layer of hollow ceramic microspheres,  
first and second dry resin binder particles each having a dimension smaller than said microspheres thoroughly intermixed with said microspheres,

said first resin binder particles being heat-processable and adequate in quantity to effect an integrating interbonded relation with said microspheres while having spaces therebetween,

said second resin binder particles being heat expandable into microballoons in interbonded relation with said microspheres and first resin binder in said spaces between said microspheres upon heat processing with said first resin particles,

wherein said first and second binder particles have been heat processed together with said microspheres into an interbonded integrated relation therebetween to form said syntactic foam." (emphasis added)

By way of comparison, applicants call the Examiner's attention to amended claim 1 of the present application, which also contains certain other different features that are underlined for emphasis; said claim reads as follows:

"1. A breathable, bead/adhesive/void space padding material comprised of a plurality of adhesive coated, polymeric beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitutes from about 10 to about 40 volume percent the total volume of said padding material."

The underlined portions of the two claims cited above will now be compared and further contrasted. To begin this part of our analysis of the differences between applicants' invention and the teachings of the '642 patent, we first note that claim 1 of said patent calls for use of a first and a second resin each having different attributes. Applicants need not employ two resins.

Next, applicants call the Examiner's attention to the fact that the '642 patent calls for use of "ceramic microspheres." As now claimed, applicants' beads are neither ceramic, nor microspheres. To support these assertions, applicants would first direct the Examiner's attention to the fact that all of applicants' independent claims (i.e., claims 1, 31, 32, 33, 34 and 35) have been amended to call for the use of plastic beads. In other words, applicants' beads are not the "ceramic" microspheres taught and claimed in the '642 patent. Further, the beads used to make applicants' padding materials are taught and claimed as "having average diameters between about 1 and about 10 mm ...". Again, this requirement is in stark

contrast to the '642 patent's use of "microspheres". Generally speaking, microspheres are "hollow spheres made of glass or silica in the micron size" (emphasis added, see Exhibit 1, a dictionary definition of the term "microsphere"). A micron is of course "one thousandth of a millimeter" (see Exhibits 2(A) and 2(B)). In contrast to this, applicants teach and claim the use of "beads" (not "microspheres") having average diameters of "1-10 mil". A mil is of course one thousandth (0.001) inch (see Exhibit 1). In other words, applicants are using "beads" that are on the order of about 5 to about 50 times larger than the largest (i.e., 177 micron) "microspheres" taught in the '642 patent. This bead size differential helps give applicants' padding materials their quality of "breathability." That is to say that the bead sizes employed by applicants do not produce the "closed voids" produced by the microspheres taught by the '642 patent as evidenced by the fact that applicants' materials have the quality of breathability. Again, applicants' need for more open void spaces follows from the fact that one of the primary purposes of their materials (but admittedly not their exclusive purpose) is as breathable padding materials – and especially those breathable padding materials adapted for use in athletic equipment or medical devices associated with the human body. It might also be noted in passing that applicants' invention is not particularly concerned with the "layered sandwich structures" taught and called for in claim 1 of the "642 patent.

Yet another important difference between the two subject materials arises from the fact that the '642 patent teaches and claims that its adhesive material is a resin that is initially used in the form of a "resin powder" that is mixed with the microspheres and "...processed through a cycle of heat melting and setting of said resin particles..." In other words, the '642 patent teaches a manufacturing process where ceramic microspheres are first mixed with a dry resin powder (actually two, different, dry resin powders) to help form the desired foam material. That is to say that the '642 patent's ceramic microspheres and its resin particles are both in a dry state when they are first placed in physical contact with each other. By way of contrast, applicants' beads are first placed in physical contact with applicants' adhesive material while the adhesive material is in a liquid state. This liquid state is not, however, the result of having melted applicants' adhesive. This circumstance is an important feature of applicants' invention and is a claim limitation in all of applicants' independent claims. Applicants have found that this manufacturing circumstance also helps provide their padding materials with improved breathability.

## 6. RE: U.S. PATENT 5,837,739

U.S. Patent 5,837,739 ("the '739 patent") teaches (see Column 2, Lines 20-28):

"Generally, syntactic foams are composite materials comprised of rigid, hollow microspheres which are adhered to one another by a bonding agent. Syntactic foams differ from blown foams, such as polystyrene foam or polyurethane foam, in that the cells of syntactic foams are formed by the incorporation of small diameter, rigid microspheres into a bonding agent (typically a resin binder) rather than by expansion of the foamed material by a volatile blowing agent such as pentane." (emphasis added)

Thus, it would appear that in the '739 patent, the term "syntactic" implies the use of microspheres having diameters in the range of about 5 to about 200 microns (see Column 4, Line 55) - and not beads having 1-10 millimeter diameters a la applicants' patent disclosure. In other words, applicants smallest beads (i.e., those having 1 millimeter diameters) are at least five times larger than the '739 patent's largest microspheres (i.e., those having 200 micron diameters).

The three main starting materials for those compositions taught by the '739 patent are resin, microspheres and a solvent. The solvent may be a solvent for the resin. For example, Example I teaches creation of a resin/catalyst/solvent (methyl ethyl ketone) system to which microspheres are then added. Thus, it would appear that the '739 patent teaches, or at least strongly suggests, that the resin can be in a liquid state when it first comes into contact with the microspheres taught in this patent. What the '739 patent does not teach or suggest however is the concept of "breathability" - and especially breathability created by use of 1-10 millimeter beads. This fact also probably follows, at least in part, from the intended use of the foams described in the '739 patent. We note for example the following statement in Column 3, Lines 47-49:

"The syntactic foam material described herein is useful as a lightweight, low-cost alternative to honeycomb for structural core in aerospace applications."

Therefore, applicants would argue that the '739 patent (like the '642 patent) fails to teach applicants' concept of "breathability." Moreover, its use of 5-200 micron sized microspheres – as opposed to applicants' 1-10 millimeter beads – is not likely to inherently produce the quality of breathability in its end products – probably, applicants speculate, for some of the same reasons the quality of breathability was not produced by the 177 micron

microsphere/adhesive system of the '642 patent – i.e., the smaller microspheres probably tend to produce "closed voids" of the type taught by the '642 patent.

7. **RE: U.S. PATENT 4,303,729**

U.S. Patent 4,303,729 ("the '729 patent") teaches the use of hollow plastic microspheres as filler materials in plastics or plastic foam compositions. The beads provide the end product with resistance to deterioration from moisture, heat, weather, etc. However, the concept of breathability is not taught or in any way suggested in the '729 patent disclosure. That is to say that the text does not mention the word, or concept, of breathability and none of the drawings show any void spaces that might at least suggest a means by which the subject material could "breathe".

8. **RE: U.S. PATENT 4,751,203**

U.S. Patent 4,751,203 ("the '203 patent") teaches a process for making solid and/or hollow vitreous (i.e., glass-like) beads. As now claimed, applicants' beads (whether solid or hollow) are made of plastic materials. More importantly, however, the '203 patent fails to teach or in any way suggest ways of making breathable padding materials.

9. **RE: U.S. PATENT 4,250,136**

U.S. Patent 4,250,136 ("the '136 patent") teaches a syntactic foam system (i.e., a microsphere-containing foam) comprised of two reinforcing layers, an intermediate foam layer wherein the reinforcing layers are made of webbing or woven cloth. The '136 patent does not teach or suggest the creation of a breathable foam - no matter what materials are used as its webbing or woven cloth component.

10. **RE: U.S. PATENT 5,336,180**

U.S. Patent 5,336,180 ("the '180 patent") teaches a hard plastic cover for a closed drug delivery system. Be that as it may, this teaching does not teach or in any way suggest a breathable padding material - whether it is provided with a hard cover or not.

## CONCLUSION

Given the above remarks, applicants would respectfully submit that since none of the references, either alone or in conjunction, teach or suggest the concept of a breathable padding material - and especially such a material created by applicants' specific starting materials and manufacturing processes, it would appear that applicants are entitled to patent protection for their conjunctive use in creating this material. That is to say that such claims seem to be especially appropriate where none of the prior art references teach end product materials and/or methods of making such materials that would inherently produce the quality of breathability that is produced by the various features previously underlined in applicants' claim 1. In closing, applicants would also ask the Examiner to consider that each of the underline attributes and methods in the following rendition of applicants' claim 1:

"1. A breathable, bead/adhesive/void space padding material comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitute from about 10 to about 40 volume percent the total volume of said padding material."

serves to help create the end product materials (and their attributes) taught by applicants' disclosure.

Therefore, applicants would ask the Examiner to reconsider his rejection and allow the claims in their now amended forms.

Respectfully submitted,

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**MARKED-UP VERSION OF THE AMENDMENTS TO THE SPECIFICATION AND  
CLAIMS 1-5, 7-15, 19-28, AND 30-35**

**IN THE SPECIFICATION:**

Lines 3-8 of page 1 were amended to reflect that U.S. Patent Application Serial No. 09/506,507 is now U.S. Patent No. 6,357,054.

**IN THE CLAIMS:**

1. (Amended) A breathable, bead/adhesive/void space padding material comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitutes from about 10 to about 40 volume percent the total volume of said padding material.
2. (Amended) The padding material of claim 1 wherein the adhesive coated, plastic beads have average diameters between about 1 and about 6 mm.
3. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are inelastic.
4. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are elastic.
5. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of polymeric materials selected from the group consisting of polyethylene, propylene and ethyl propylene copolymer.

7. (Amended) The padding material of claim 1 wherein the adhesive coated, plastic beads have diameters ranging from about 1 mm to about 3 mm.
8. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are solid.
9. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are hollow.
10. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of [a ceramic] resin material.
11. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made from a [glass] phenol based resin material.
12. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of [a plastic] an expanded ethylene material.
13. (Amended) The padding material of claim 1 wherein the adhesive coated, plastic beads have one or more holes passing through their bodies.
14. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of a thermosetting material.
15. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of a thermoplastic material.
19. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are of different sizes.

20. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are corona plasma treated.
21. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are coated with a coupling agent to promote bead/adhesive bonding.
22. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are flame treated.
23. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are plasma jet treated.
24. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are spherical.
25. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are ellipsoid.
26. (Amended) The padding material of claim 1 wherein said adhesive coated, plastic beads are made of different plastic materials.
27. (Amended) The padding material of claim 1 wherein said material is placed in a cloth[-like] casing.
28. (Amended) The padding material of claim 1 wherein said material is placed in a net[-like] casing.
30. (Amended) The padding material of claim 1 wherein at least 50 percent of the adhesive coated, plastic beads are at least 80 percent covered by the adhesive.

31. (Amended) A breathable, bead/adhesive/void space padding material for sports equipment comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitutes from about 10 to about 40 volume percent the total volume of said padding material.

32. (Amended) A breathable, bead/adhesive/void space padding material for medical equipment comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void space that constitutes from about 10 to about 40 volume percent the total volume of said padding material.

33. (Amended) A breathable, bead/adhesive/void space padding material for use in packaging other objects, said material being comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitutes from about 10 to about 40 volume percent the total volume of said padding material.

34. (Amended) A breathable, bead/adhesive/void space construction material comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void spaces that constitutes from about 10 to about 40 volume percent the total volume of said padding material.

35. (Amended) A breathable, bead/adhesive/void space filter material comprised of a plurality of adhesive coated, plastic beads having average diameters between about 1 and about 10 mm and of which at least 50 percent are at least 50 percent coated with an adhesive that is cured from a liquid state (wherein the adhesive is not in a melted state) while in initial contact with the beads, and wherein a cured form of said adhesive has a hardness ranging from about Shore A 20 to about Shore A 95 and is used in a quantity such that it represents between about 20 and about 80 weight percent of the padding material and thereby serving to create a system of void space that constitutes from about 10 to about 40 volume percent the total volume of said padding material.